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AUTHOR Kazlauskas, Edward John; Iehl, Ronald Edwin
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ABSTRACT

It is a given today that we are living in an information age. Numerous studies and statistics attest to this fact. But not only is information proliferating at a rapid rate, the manner in which people are using information is changing, as is the nature of information itself. Such changes as these have meant that accessing and using information have become more complex. This complexity has been compounded by the rapid development of new technologies designed both to organize and provide access to information. In this environment there is a need for individuals to use information for their own personnel and organizational empowerment; those without such access will have difficulty in a modern, information-based society. This paper addresses the concept of information as power. There is a discussion of the means by which individuals can access information, through traditional means and through the new technologies. Impediments to the access of information are described and examples from case studies (from an international perspective) are provided which illustrate how learners have been "information empowered." Following these examples, the issues of expanding opportunities for use of electronic information systems to the urban disadvantaged and internationally to developing countries are discussed, and finally, suggestions for strategies to incorporate the concept of information power into the curricula are provided. (Contains 14 references.) (KRN)

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USE OF ELECTRONIC INFORMATION SYSTEMS - ANOTHER PERSPECTIVE

by
Edward John Kazlauskas
Professor, Instructional Technology
School of Education
University of Southern California
and
Ronald Edwin Iehl
Education Bibliographer
University Library
California State University, Northridge

ED 363 340

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THE INFORMATION AGE

It is a given today that we are living in an information age and that information is proliferating at a rapid rate. Numerous studies and statistics describe the characteristics and attest to the rapid growth of information. Examples of the most popular works include those by Drucker (1969), Naisbitt (1982, 1990), and Porat (1972). But not only is information proliferating at a rapid rate, the manner in which people are using information is changing, as is the nature of information itself. An example of the change is the current 'directory-type' data, such as social service information and airline reservation information, which quickly becomes out-dated and is replaced by new data - the old information is obsolete. In addition, there are other 'new' characteristics of information, such as fragmentation of information into separate fields; but at the same time other fields have become very interdisciplinary in nature. These are only a few examples of the changing nature of information. Such changes as these have meant that accessing and using information have become more complex.

Various technologies have been used to organize and, most

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importantly, to provide access to information. And, it is common now for individuals to utilize new access means and modes to obtain information. Individuals are accessing a wide array of databases and using electronic mail from their home computers. Telefacsimilie transmission is common for local and worldwide communications. Computers and the use of databases applications have become more common in schools. Needless to say that we are living in a rapidly developing environment of information and the technologies which provide delivery. These developments are providing credibility to the concept of the global village as coined by Marshall McLuhan in the 1960's. (Wright, 1990).

EMPOWERMENT

In today's information-rich environment there is a need for individuals to use information to provide for their personal and organizational empowerment. Individuals can locate information to fulfill their needs in such diverse areas as personal growth and development, scholarships and jobs, or simply for survival; organizations can use information for the competitive edge, or for ecomomic and political purposes. Unfortunately, many of those most at risk, such as the urban disadvantaged and members of the third world, are frequently the ones least likely to have a background and the facilities to be empowered through information.

This paper addresses examples of how individuals can access and use information through electronic means and, therefore, become empowered. The discussion is limited to electronic information systems and not focused in this context with reading,

libraries, and related areas. In addition, the paper also describes a number of impediments to information empowerment, and provides a discussion of the implications for education.

EXAMPLES

Individuals can become empowered through the use of a wide array of electronic information systems. To do so there are only a few hardware and software requirements, namely a personal computer, modem, communications software, a telecommunications link; and access, such as a valid account to use the system, a login number and password. Of course, there are the necessary prerequiste education and training requirements.

There are many examples of how electonic information systems are being used today. One scenario, an individual from their home, the local library, church, or community center can access a social services or community resources database. Data from such a referral database can provide information, typically contact name, address, and telephone number, for such diverse topics as hospice care facilities or alchohol and drug assistance programs. The person is able to find assistance to resolve personal or family social problems.

Students using their personal computers in the dormitory can access library book and periodical databases and locate sources for their papers. And, as an example certain institutions, such as the University of Southern California, are planning for full-text delivery of information to students and faculty through the personal computer -- in the future students may not need to physically go to the library to locate,

photocopy, and read the text. At California State University Northridge faculty and students are already downloading full text from a myriad of newspaper and periodical titles.

Students in a classroom in the U.S. can interact with students in schools in diverse communities elsewhere in the U.S., or in other countries, via telecommunications, such as the ability through the AT&T Learning Network (AT&T Learning Network Newsletter). Part of their regular class activities can be cross-cultural investigations. Through such systems students can experience national and international diversity first-hand.

A business person can search for specific information in the NASA database regarding the development of a new product. Information generated as part of NASA's programs can be located in this database and as a result provide a 'spinoff' technology, or the reapplication of a technology for another use, oftentimes considerably different from the original use. The business person has been able to locate appropriate information and save considerable R&D investment costs. (McCarthy, 1989).

Competitor intelligence is information with a strategic point of view, or in other words, information which is used to support the strategic planning of an organization and the corporate decision making process. From the broad perspective, it involves a determination of the strategies and goals of organizations with similar lines of business. In tactical terms, it involves the gathering, analysis, and presentation of data dealing with acquisitions, new product development, new ventures, new market entries, pricing, promotion, etc. Much of these data can be compiled through use of information in databases. Thus,

corporate executives can have sufficient information in order to make informed long-term decisions. As a side-line, information gleaned from databases may also be used for espionage purposes, both industrial and governmental.

Users from throughout the world access the AGRIS database created through support from UNESCO. This is a decentralized, cooperatively created, multilingual database with input from many countries. It is an example of a system with data directly applicable to developing countries since detailed, locally-generated agricultural information is available for a region, such as Southeast Asia.(Wood) In a Worldwatch Institute study reported on in the Los Angeles Times, a worldwide water crisis is imminent. But the report indicates that techniques are now available in the U.S. which could increase water efficiency and information systems can provide descriptions of these techniques. An example is the California Irrigation Management Information Systems which has enabled farmers to save in their use of irrigation water by providing on-demand information on evaporation rates and crop water requirements. (Ambramson, 1992).

These are just a few of the multiplicity of examples available, in various segments of society, which illustrate how individuals and organizations can become empowered through the use of information systems.

ISSUES

The above were but several examples of ways in which electronic information can be used and how individuals can be information empowered. Unfortunately, not all students (and other

individuals) are acquiring the skills to become information empowered. This is not only due to the lack of the teaching and learning in this specific area, but also because the prerequisite basic skills have not be acquired.

A desire has been expressed in some quarters to expand the opportunity for use of electronic information system to the urban disadvantaged and internationally to developing countries. The overall concept is to create an infrastructure which assists in economic and social development, fosters the notion of the global village, and eventually moves towards a paperless society. But if we look at the urban setting, specifically the urban disadvantaged, and also at the international arena, there are a host of issues which need to be addressed.

Several general requirements should be addressed. Accessing information systems is not a major concern to governments (be they local, state, or national) in situations where there is the need for developing functional literacy. A certain level of education and, if we are talking about developing countries, a certain level of societal development, is essential. Information empowerment is not a substitute for the development of other basic skills. These are normally required before one can become information empowered.

There are different perceptions of electronic information and its importance. For example in the U.S. it may be considered a commodity which provides individuals with certain capabilities they would otherwise not have. In the former U.S.S.R. it was controlled and a power source for the elite. (Barry) Individuals

in developing countries depend more on verbal information and thus electronic information is not highly valued.

From the access perspective, availability of information systems do not require massive technology infusion. This is certainly a positive. As was stated previously, the hardware and software requirements are minimal. Even schools in poor urban settings can have the capability with minimal investment. And for developing countries there is not the requirement of a major new infrastructure. There are minimum technology requirements and infrastructure costs. But being realistic, experience indicates that the telecommunication networks that do exist in some developing countries are sometimes unrealiable. However, some developing, as well as developed countries, are targeting telecommunications infrastructure as a major development concern since they view this as essential for economic viability.

There is indeed a trade-off to consider in having information available electronically rather than in print form. From the systems viewpoint there can be a positive 'matter-energy' trade-off. For example, in a developing country the use of computer terminals or personal computers to access full-text information (a definite trend in computer storage technology) may by-pass the costly and labor intensive need of building libraries or other such facilities, acquiring and having such materials physically delivered, and training staff to process and house the materials. Indeed, this suggests interest, although a divergence of opinions exist, on the developement of the paperless society. (As an example, several conflicting articles deal with Sub-Saharan Africa and the Paperless Society). (Olden,

1987; Tiamiyu, 1989)

We are witnessing the distribution and internationalization of the workplace through telecommuncations. For example, a major information service in New York City sends unprocessed text for coding and input to their database to The People's Republic of China for abstracting. The information is sent, processed, and then returned electronically. The issue in this decision making may not only be cost but also education - could it be that such educated personnel who were willing to do this type of work were not available? It is imperative to have the necessary infrastructure but also a populace which is educated and information technology literate.

An impediment to the development of information empowerment is the newness of the concept and thus it is overlooked. This is true at the local, state and national levels within the U.S. and obviously true in other countries. Also, an interesting obstacle to the development of electronic information services is that it runs contrary to the concept of prepackaged information, that is books and magazines, and thus has certain invested groups opposed to it. This is less of an issue in some countries/regions where book publishers have also become the electronic publishers.

The majority of computerized databases have been created by developed countries in North America and Europe. It has been stated that as much as 97% of the data are not relevant to developing countries. This number though may be exaggerated. But concern has been raised as to the relevance and reliance on first

world information suppliers. There is a desire by professionals in developing countries to cooperate in developing and internationalizing their own systems rather than relying (and being economically dependent) on systems developed elsewhere. (Woon)

To be used, information systems must be perceived as being able to fulfill information needs. This point holds true across countries and population characteristics. And, a used and useful information system requires education!

IMPLICATIONS FOR EDUCATION

The concept of information power through the use of electronic systems must to be incorporated into the school's curriculum. This should be part of an overall strategy to incorporate computer technology into the curriculum and classroom. Obviously guidelines are necessary to accomplish this. Although as stated previously this area is oftentimes overlooked, there are some positive examples and guidelines to examine.

Notable among these is Information Power, a joint publication by the American Association of School Librarians and the Association for Educational Communications and Technology. (Information Power, 1988). This publication outlines the need for developing an information curriculum, incorporating the use of electronic information systems which are integrated into the curriculum of the school. In addition, two noteworthy specific guidelines can be found in the State of Washington publication, "Information Skills Curriculum Guide," and in "Information Literacy Skills for Oregon Schools K-12." On the professional

education level, the International Society for Technology in Education has expressed concern for this area and hopefully can foster attention to the area of information empowerment.

A report on information literacy (American Library Association) outlined a number of recommendations which are relevant to us and to other nations concerned with information empowerment. Two of the most relevant follow.

There must be a reconsideration of the ways information has been organized institutionally, how information access is structured, and what it's role is in our lives at home, in the community, in the school, and in the work place -- the ways in which information is viewed is still tied to the 19th Century. There must be a reconceptualize of information. The performance expectations of students and teachers as espoused by States, commissions, academic governing boards, and teacher education programs should be modified to include information literacy concerns - the concept of the teacher as the facilitator of learning requires that an expansive array of information be available.

CONCLUSION

Developments in the area of computer information systems are extraordinary, and we will continue to witness technological advances. The information available through new information systems has the ability to empower individuals - our educational programs must assist students to foster this ability.

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